AMENDMENTS TO THE SPECIFICATION

Please replace the paragraph beginning on page 2, line 19, with the following rewritten paragraph:

-- To climb the airframe, the collective pitch ~~rudder~~ blade angle needs to be changed to control the thrust of a main rotor. Hitherto, an altitude control rule of detecting the altitude and feeding back the altitude and changing the collective pitch ~~rudder~~ blade angle based on the deviation between the altitude and a predetermined altitude command (target altitude) is adopted for controlling the thrust of the main rotor, as shown in FIG. 3. A collective pitch ~~rudder~~ blade angle command to cause the main rotor to produce the thrust for supporting the weight of the airframe is calculated by an integrator (not shown), etc., of the altitude control rule in FIG. 3. --

Please replace the paragraph beginning on page 4, line 23, with the following rewritten paragraph:

-- To the ends, according to the invention as in the first aspect, there is provided an unmanned helicopter for making a flight autonomously, the unmanned helicopter including altitude control device for giving a command of a collective pitch ~~rudder~~ blade angle based on the deviation between a fed-back altitude and an altitude command and the deviation between a fed-back climb rate and a climb rate command; position control device for performing position control based on the deviation between a fed-back position and a position command with respect to a horizontal position and the deviation between fed-back speed and a speed command; attitude control device for performing attitude control of an airframe based on the deviation between a fed-back attitude angle and an attitude angle command; and takeoff device, upon reception of a takeoff start command from the ground, for causing the airframe to take off and climbing the airframe to a first altitude while increasing the collective pitch ~~rudder~~ blade angle without performing the altitude control of the altitude control device and then causing the altitude control device to start the altitude control. --

Please replace the paragraph beginning on page 5, line 17, with the following rewritten paragraph:

According to the invention as in the first aspect, the helicopter includes the takeoff device, upon reception of a takeoff start command from the ground, for causing the airframe to take off and climbing the airframe to the first altitude while increasing the collective pitch ~~rudder~~ blade angle without performing the altitude control of the altitude control device and then causing the altitude control device to start the altitude control, so that the airframe can be promptly brought away from the ground. Consequently, continuation of an unstable state before the attitude of the airframe is stabilized for a given time in the proximity of the ground can be circumvented and safety at the takeoff time can be ensured. Moreover, the takeoff device controls the operation timing of the altitude control device used previously, so that the software configuration is comparatively simple. Consequently, an increase in the airframe price can be suppressed. --

Please replace the paragraph beginning on page 6, line 21, with the following rewritten paragraph:

-- According to the invention as in the third aspect, there is provided an unmanned helicopter for making a flight autonomously, the unmanned helicopter including altitude control device for controlling a collective pitch ~~rudder~~ blade angle based on a ~~rudder~~ blade angle command calculated based on the deviation between a fed-back altitude and an altitude command and the deviation between a fed-back descent rate and a descent rate command; position control device for performing position control based on the deviation between a fed-back position and a position command with respect to a horizontal position and the deviation between fed-back speed and a speed command; attitude control device for performing attitude control of an airframe based on the deviation between a fed-back attitude angle and an attitude angle command; and descending device for stepwise changing descent rate command of the altitude control device for causing the airframe to descend to a second altitude and giving a descent rate command smaller than the descent rate command to the second altitude to the

altitude control device for causing the airframe to descend from the second altitude to the ground. --

Please replace the paragraph beginning on page 8, line 24, with the following rewritten paragraph:

-- The invention as in the fifth aspect is characterized by the fact that the unmanned helicopter as in the third or the forth aspect further includes landing determination device for determining that the airframe lands if the ~~rudder~~ blade angle command which is less than a predetermined value continues for a predetermined time. --

Please replace the paragraph beginning on page 9, line 5, with the following rewritten paragraph:

-- According to the invention as in the fifth aspect, the unmanned helicopter includes the landing determination device for determining that the airframe lands if the ~~rudder~~ blade angle command of a predetermined value or less continues for a predetermined time, so that an erroneous determination of landing can be prevented and safe landing operation can be ensured. --

Please replace the paragraph beginning on page 11, line 16, with the following rewritten paragraph:

-- According to the invention as in the tenth aspect, there is provided a landing method of an unmanned helicopter including changing a collective pitch ~~rudder~~ blade angle based on a ~~rudder~~ blade angle command calculated based on the deviation between a fed-back altitude and an altitude command and the deviation between a fed-back altitude change rate and an altitude change rate command, descending, and determining that the helicopter lands if the ~~rudder~~ blade angle command of a predetermined value or less continues for a predetermined time. --

Please replace the paragraph beginning on page 11, line 25, with the following rewritten paragraph:

-- According to the invention as in the tenth aspect, the collective pitch ~~rudder~~ blade angle is changed based on the ~~rudder~~ blade angle command calculated based on the deviation between the fed-back altitude and the altitude command and the deviation between the fed-back altitude change rate and the altitude change rate command, descending is performed, and if the ~~rudder~~ blade angle command of a predetermined value or less continues for a predetermined time, it is determined that the helicopter lands. Thus, an erroneous determination of landing can be prevented and safe landing operation can be ensured. --

Please replace the paragraph beginning on page 15, line 4, with the following rewritten paragraph:

-- The airframe GPS receiver 22, the intertial sensor 23, the magnetic bearing sensor 24, and the command receiver 26 are connected to the flight controller 21, as shown in FIG. 1. The flight controller 21 controls the collective pitch ~~rudder~~ blade angle and the cyclic pitch ~~rudder~~ blade angle of the rotor 28 for accomplishing predetermined flight control based on various pieces of data detected by the airframe GPS receiver 22, the intertial sensor 23, and the magnetic bearing sensor 24. --

Please replace the paragraph beginning on page 16, line 19, with the following rewritten paragraph:

-- To begin with, the altitude control will be discussed. An altitude control program for accomplishing the altitude control is stored in the memory of the flight controller 21. When the arithmetic processing circuit of the flight controller 21 executes the altitude control program, the deviation between the airframe altitude detected and fed back by the airframe GPS receiver 22 and an altitude command (altitude deviation), the integration value of the altitude deviation, and the deviation between the fed-back airframe altitude change rate and an altitude change rate command are calculated and the calculation values are multiplied by a predetermined gain and the results are added, whereby a collective pitch ~~rudder~~ blade angle command of the airframe is

calculated. This collective pitch ~~rudder~~ blade angle command is a ~~rudder~~ blade angle command in the invention. --

Please replace the paragraph beginning on page 17, line 8, with the following rewritten paragraph:

-- The collective pitch ~~rudder~~ blade angle is controlled in a ~~rudder~~ blade angle drive actuator based on the collective pitch ~~rudder~~ blade angle command, whereby the altitude control of the airframe can be performed. That is, the altitude control program and the arithmetic processing circuit of the flight controller 21 provide altitude control device in the invention. --

Please replace the paragraph beginning on page 18, line 20, with the following rewritten paragraph:

-- An attitude control program for accomplishing the attitude control is stored in the memory of the flight controller 21. When the arithmetic processing circuit of the flight controller 21 executes the attitude control program, the deviation between the airframe attitude angles (pitch angle and roll angle) detected and fed back by the intertial sensor 23 and the attitude angle commands calculated by the position control program (attitude angle deviation) and the integration value of the attitude angle deviation are calculated and the calculation values are multiplied by a predetermined gain and the results are added. Then, the fed-back airframe attitude angle speed is subtracted from the addition result to calculate a cyclic pitch ~~rudder~~ blade angle command of the airframe. --

Please replace the paragraph beginning on page 19, line 8, with the following rewritten paragraph:

-- The longitudinal cyclic pitch ~~rudder~~ blade angle and the lateral cyclic pitch ~~rudder~~ blade angle are controlled in the ~~rudder~~ blade angle drive actuator based on the cyclic pitch ~~rudder~~ blade angle command, whereby the position control and the attitude control of the airframe can be performed. That is, the position control program, the attitude control program,

and the arithmetic processing circuit of the flight controller 21 provide position control device and attitude control device in the invention. --

Please replace the paragraph beginning on page 20, line 7, with the following rewritten paragraph:

-- To begin with, the automatic takeoff control will be discussed. A takeoff control program for accomplishing predetermined automatic takeoff operation is stored in the memory of the flight controller 21. Upon reception of a takeoff start command from the radio control apparatus 14, the arithmetic processing circuit of the flight controller 21 executes the takeoff control program. While increasing the collective pitch ~~rudder~~ blade angle command at a constant rate, thereby increasing the climb rate (altitude change rate), the takeoff control program causes the airframe to take off and climbs the airframe to a predetermined safe altitude. --

Please replace the paragraph beginning on page 20, line 18, with the following rewritten paragraph:

-- The safe altitude, which is a first altitude in the invention, refers to an altitude at which the airframe is completely brought away from the ground and it is made possible to apply usual altitude control rule. The safe altitude can be set appropriately in response to the weight of the airframe, the weather conditions, the touchdown conditions, etc.; in the embodiment, an altitude of "several 10 centimeters (preferred 30 - 60 centimeters)" that can be reliably measured by differential GPS (altitude and position measurement device) and is sufficiently low is the safe altitude. The increase rate of the collective pitch ~~rudder~~ blade angle command by the takeoff control program can be set appropriately in response to the weight of the airframe and the weather conditions. --

Please replace the paragraph beginning on page 22, line 17, with the following rewritten paragraph:

-- When the altitude control program is started, the value of the collective ~~rudder~~ blade angle command when the airframe arrives at the safe altitude is used as the initial value of the

integrator (not shown) in the altitude control rule in FIG. 3. In the embodiment, the altitude change rate command (climb rate command) in the altitude control rule in FIG. 3 is made constant. Further, the altitude change rate command is integrated by the integrator shown in FIG. 3 to calculate an altitude command, and the initial value of the integrator is the safe altitude (several 10 cm).

Please replace the paragraph beginning on page 26, line 8, with the following rewritten paragraph:

-- A landing determination program for accomplishing predetermined landing determination processing when the helicopter arrives at the target descent altitude is stored in the memory of the flight controller 21. When the arithmetic processing circuit of the flight controller 21 executes the landing determination program, whether or not the helicopter lands can be determined by the collective pitch ~~rudder~~ blade angle command calculated by executing the altitude control program. --

Please replace the paragraph beginning on page 26, line 25, with the following rewritten paragraph:

-- Consequently, the deviation between the fed-back altitude data and the altitude command value gradually grows in the negative direction and therefore the value of the collective pitch ~~rudder~~ blade angle command output to correct the deviation in the negative direction gradually lessens and soon becomes 0 degrees. The landing determination program monitors the collective pitch ~~rudder~~ blade angle command and if the collective pitch ~~rudder~~ blade angle command of a predetermined value or less continues for a predetermined time, the landing determination program determines that the helicopter lands. --

Please replace the paragraph beginning on page 27, line 10, with the following rewritten paragraph:

-- Hitherto, a technique of detecting the airframe landing based on intertial sensor output of shock at the touchdown time or a technique of detecting the airframe landing by an electric

switch installed in a foot is adopted; however, an erroneous determination of landing although the helicopter is still flying may be made according to the techniques in the related arts. In contrast, in the embodiment, the landing determination program is executed and monitors the collective pitch ~~rudder~~ blade angle command, thereby determining whether or not the helicopter lands. Thus, an erroneous determination of landing can be prevented and safe landing operation can be ensured. --

Please replace the paragraph beginning on page 29, line 18, with the following rewritten paragraph:

-- The unmanned helicopter 20 in the flight control system 1 according to the embodiment includes the landing determination device (landing determination program and arithmetic processing circuit) for determining whether or not the helicopter lands based on the collective pitch ~~rudder~~ blade angle command, so that an erroneous determination of landing can be prevented and safe landing operation can be ensured. --

Please replace the paragraph beginning on page 32, line 3, with the following rewritten paragraph:

-- According to the invention as in the first aspect, the takeoff device causes the airframe to take off and climbs the airframe to the first altitude while increasing the collective pitch ~~rudder~~ blade angle without performing the altitude control, so that the airframe can be promptly brought away from the ground. Consequently, safety at the takeoff time can be ensured. Since the takeoff device controls the operation timing of the altitude control device used previously, the software configuration is comparatively simple. Consequently, an increase in the airframe price can be suppressed. --

Please replace the paragraph beginning on page 33, line 17, with the following rewritten paragraph:

-- According to the invention as in the fifth aspect, the landing determination device determines that the airframe lands if the ~~rudder~~ blade angle command of a predetermined value

or less continues for a predetermined time, so that an erroneous determination of landing can be prevented and safe landing operation can be ensured. --

Please replace the paragraph beginning on page 34, line 25, with the following rewritten paragraph:

-- According to the invention as in the tenth aspect, the collective pitch ~~rudder~~ blade angle is changed based on the ~~rudder~~ blade angle command calculated based on the deviation between the fed-back altitude and the altitude command and the like, descending is performed, and if the ~~rudder~~ blade angle command of a predetermined value or less continues for a predetermined time, it is determined that the helicopter lands. Thus, an erroneous determination of landing can be prevented and safe landing operation can be ensured. --